

2014 IEL Update & eLearning



IEEE with CES 2014

IEEE Consumer Communications and Networking Conferences

- ✓올해는 라스베이거스에서 1월 10일부터 13일에 걸쳐 개최
- ✓세계최대의 전자제품 전시회인 CES 2014와 함께 진행
- ✓컨슈머 통신과 네트워킹 전분야에 걸쳐 삼성, HARMAN 등의 세계적인 기업 및 학계의 연구자, 개발자, 실무자들이 참가
- ✓10개의 technical track과 최근 관심받는 주제분야에 대한 스페셜 세션이 진행



-Wireless Communication

-Smart Spaces and Wireless Networks

-Social Networking

-Networked Games

-Big Data Security and Privacy

-Game Theory in Mobile Internet

-Content Caching and Distribution in
Future Mobile Networks ...



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주요 역할

- **Membership**
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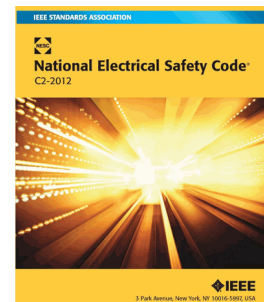
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- IEEE Spectrum – now available from 1964-Present
- Electrical Engineering (now IEEE Spectrum)-1931-1963
- Circuits and Systems Magazine, IEEE 1979-1984
- Engineering Management, IEEE Transaction on 1970-1982
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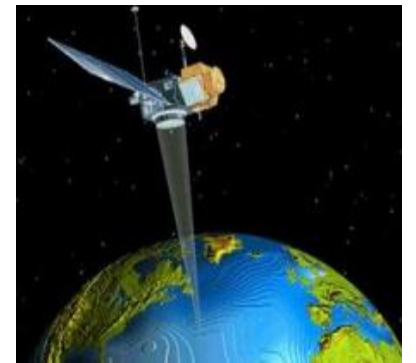
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- ✓ IEEE Transactions on Cloud Computing
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- ✓ China Communications Magazine
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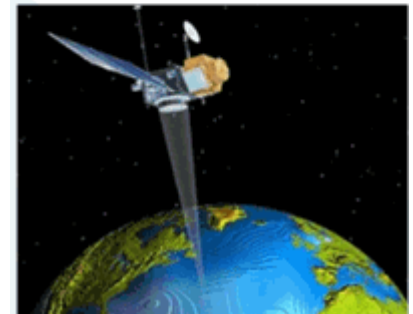
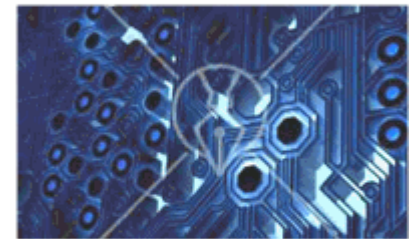
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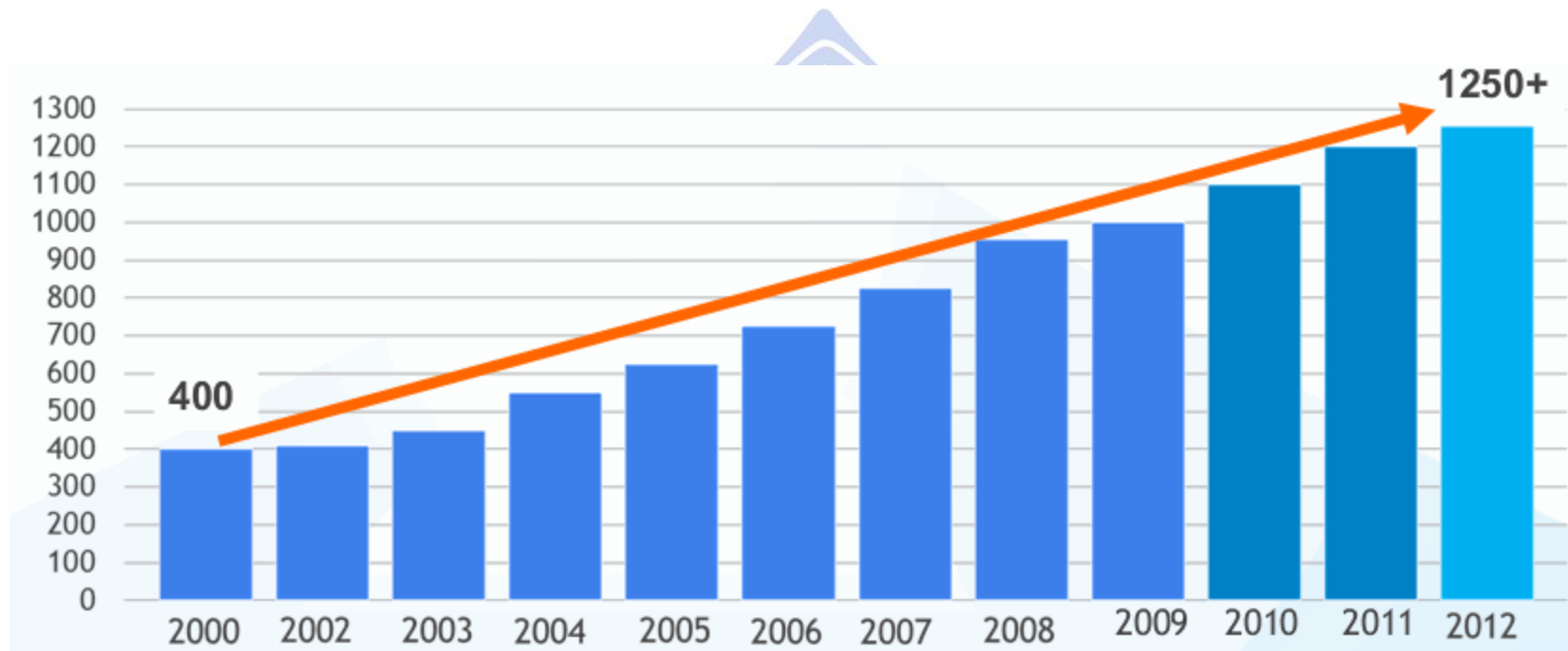
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Analysis of Patent Referencing to IEEE Papers, Conferences,
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Report prepared for:

Institute of Electrical and Electronic Engineers
445 Hoes Lane
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Piscataway, NJ 08855-1331, USA

Report prepared by:

Anthony Breitzman, Ph.D.
1790 Analytics LLC
130 Haddon Avenue
Haddonfield, NJ 08033
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June 5, 2013

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- Over three times more citations than any other publisher
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1790 Analytics LLC performed an in-depth analysis of the science references from top patenting firms.



Source: 1790 Analytics LLC 2013



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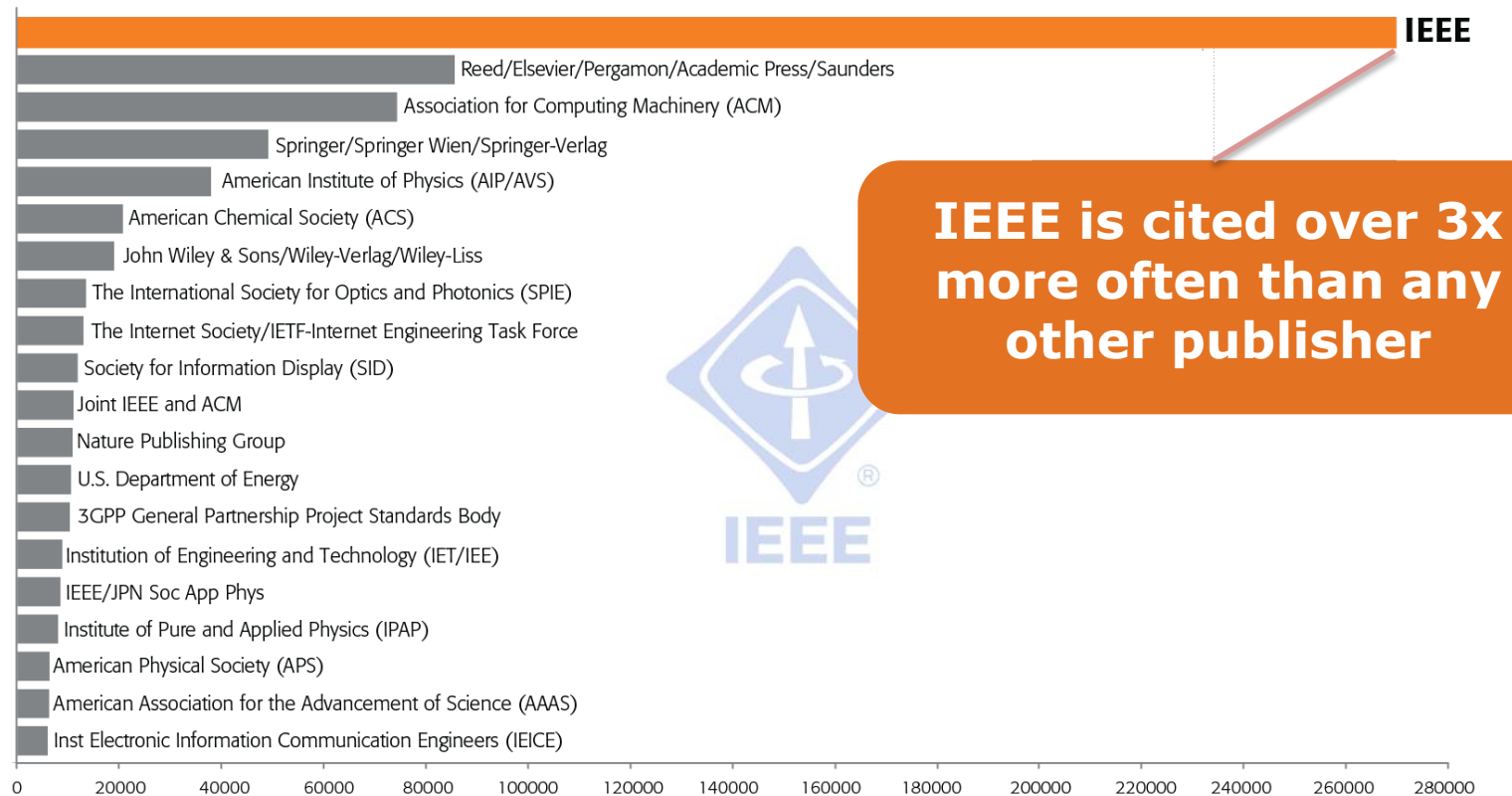
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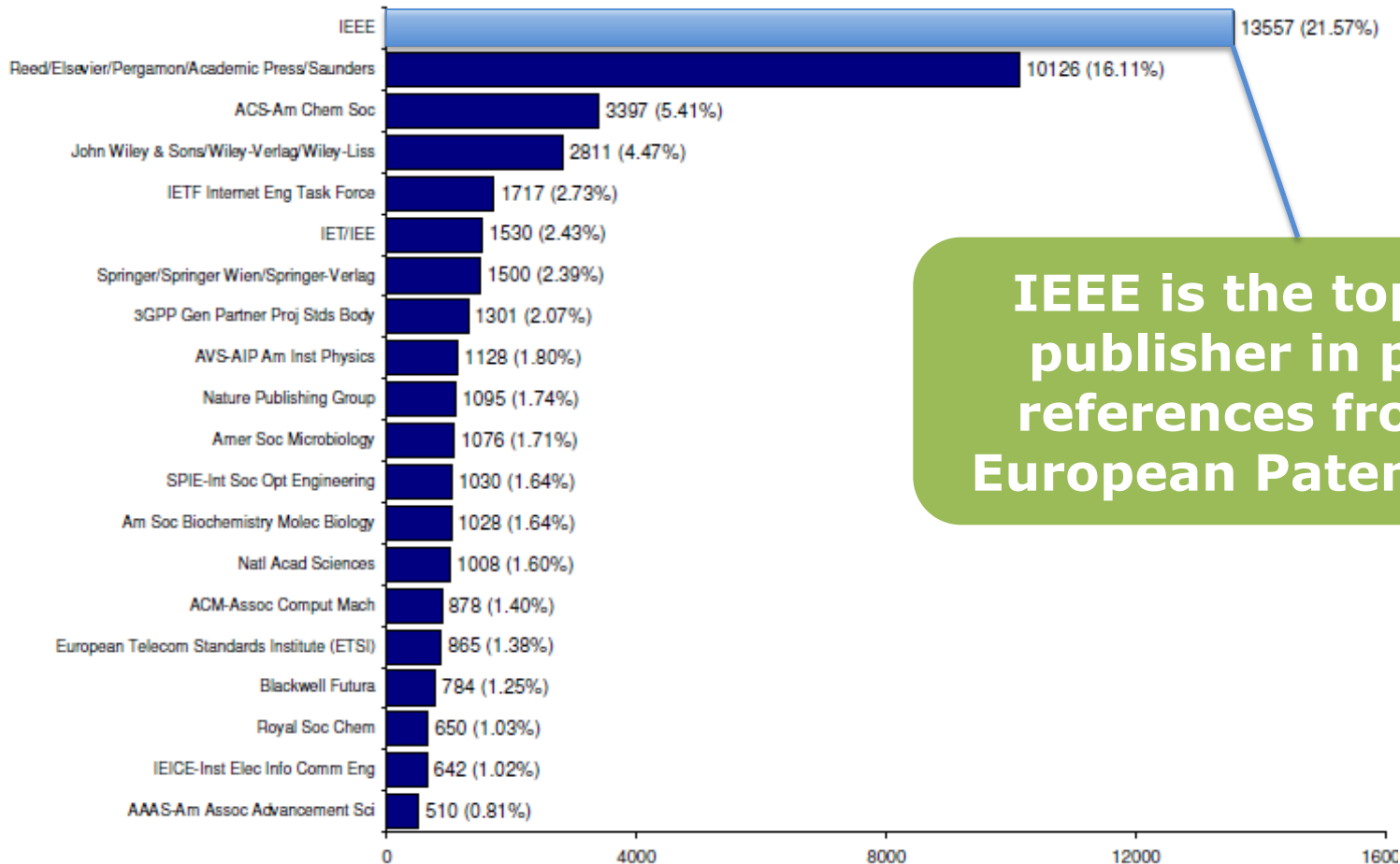
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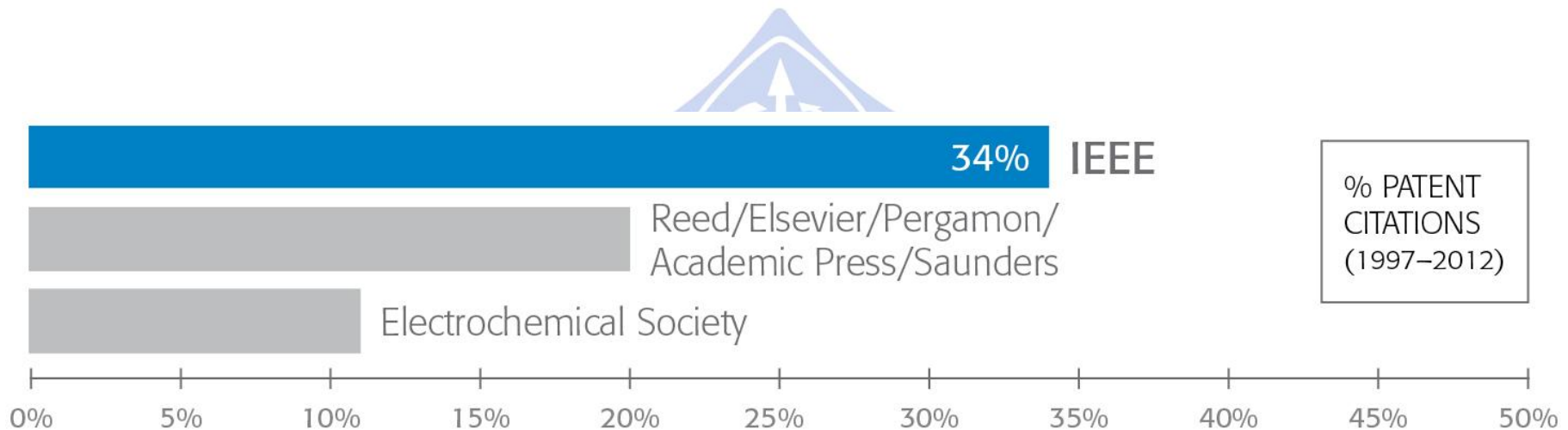
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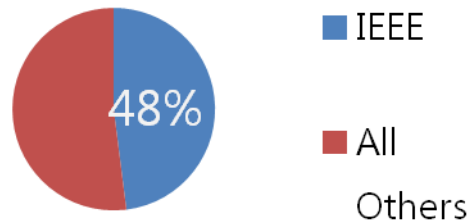
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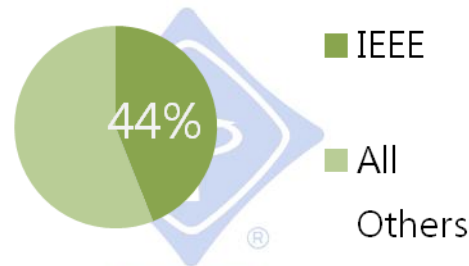
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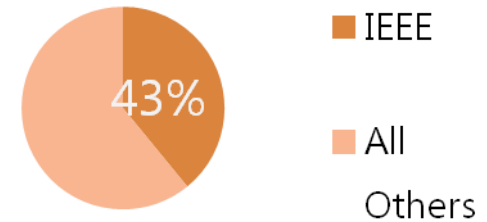
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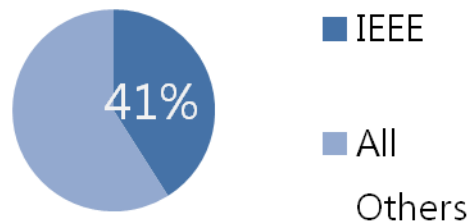
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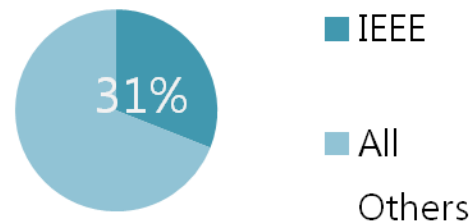
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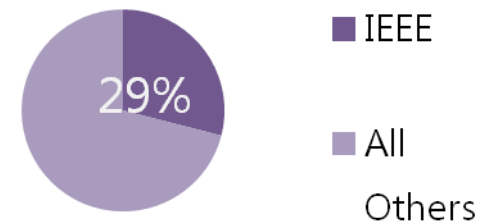
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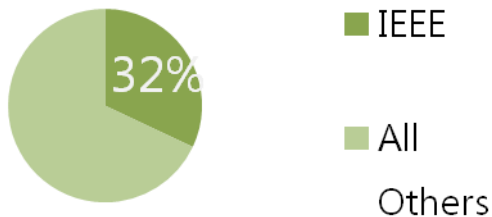
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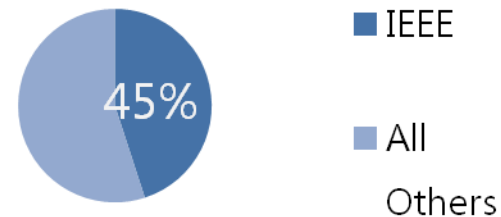
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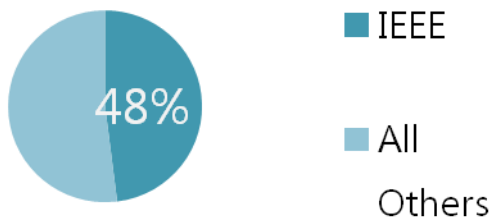
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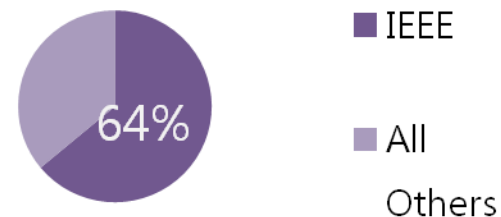
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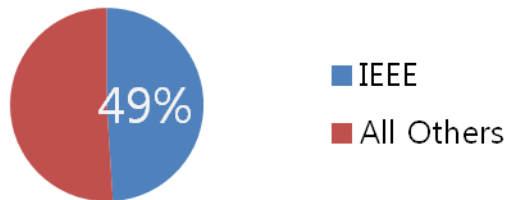
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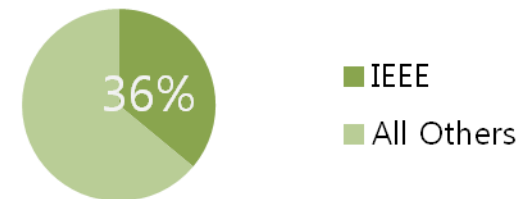
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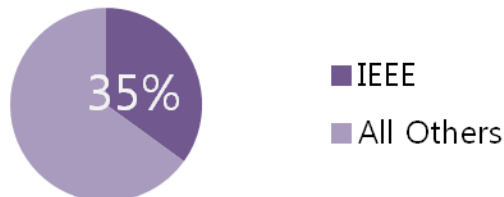
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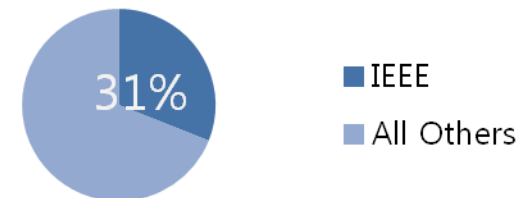
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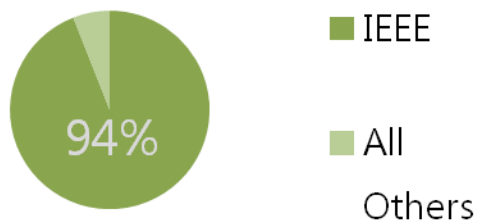
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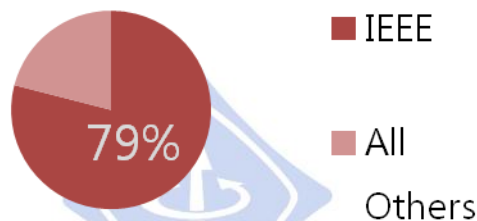
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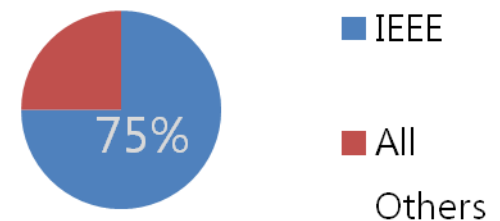
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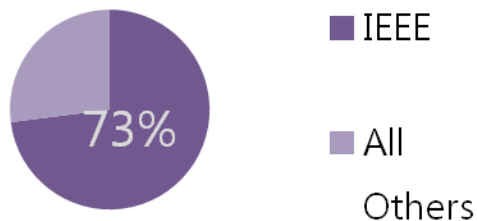
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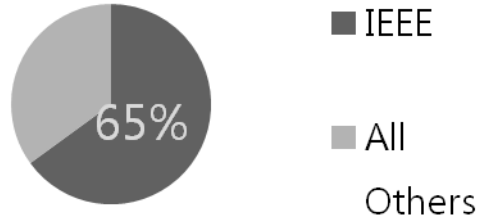
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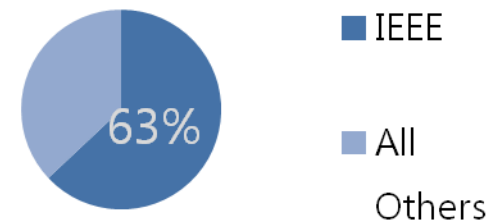
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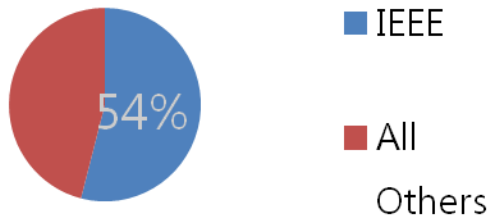
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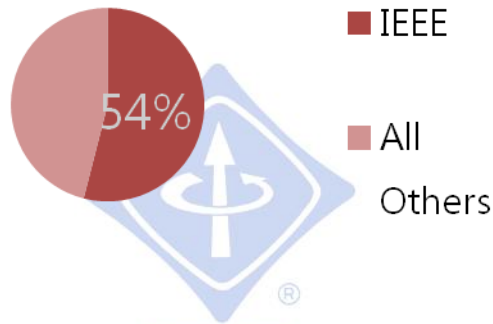
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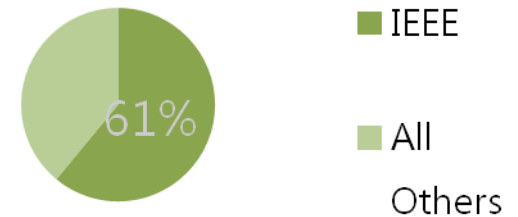
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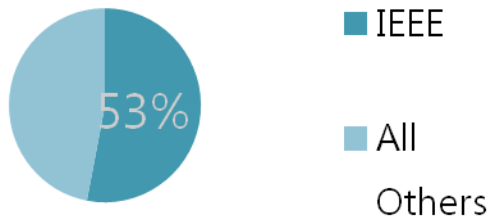
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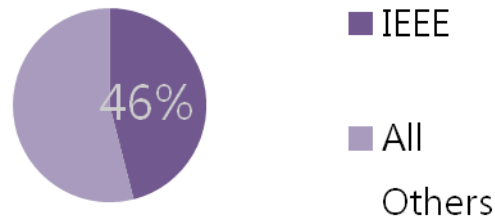
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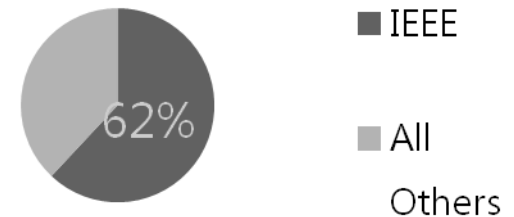
AMD
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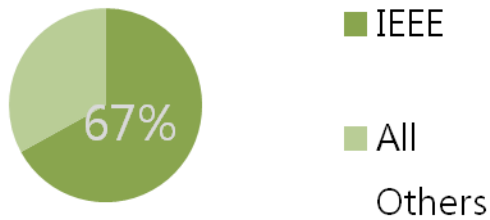
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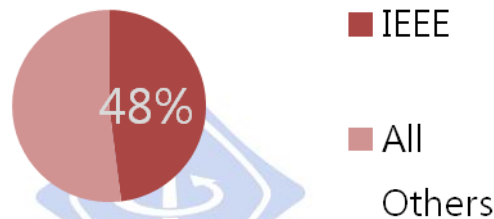
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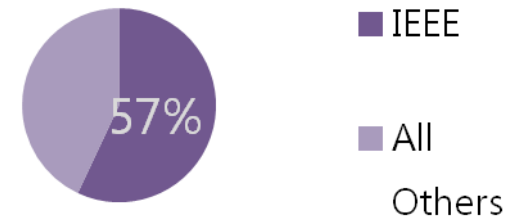
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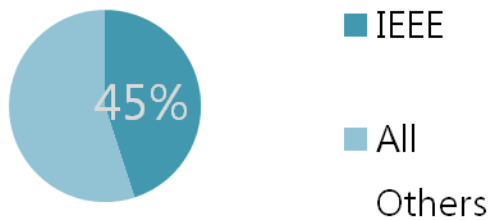
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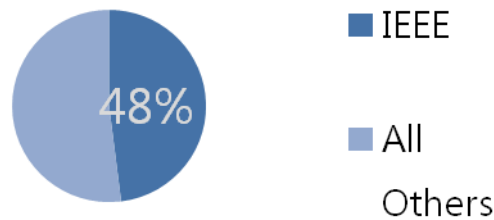
**Qualcomm
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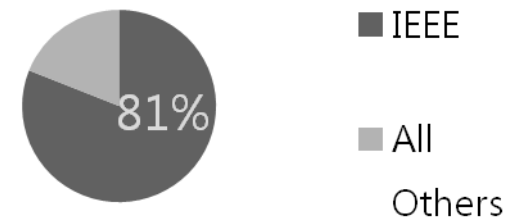
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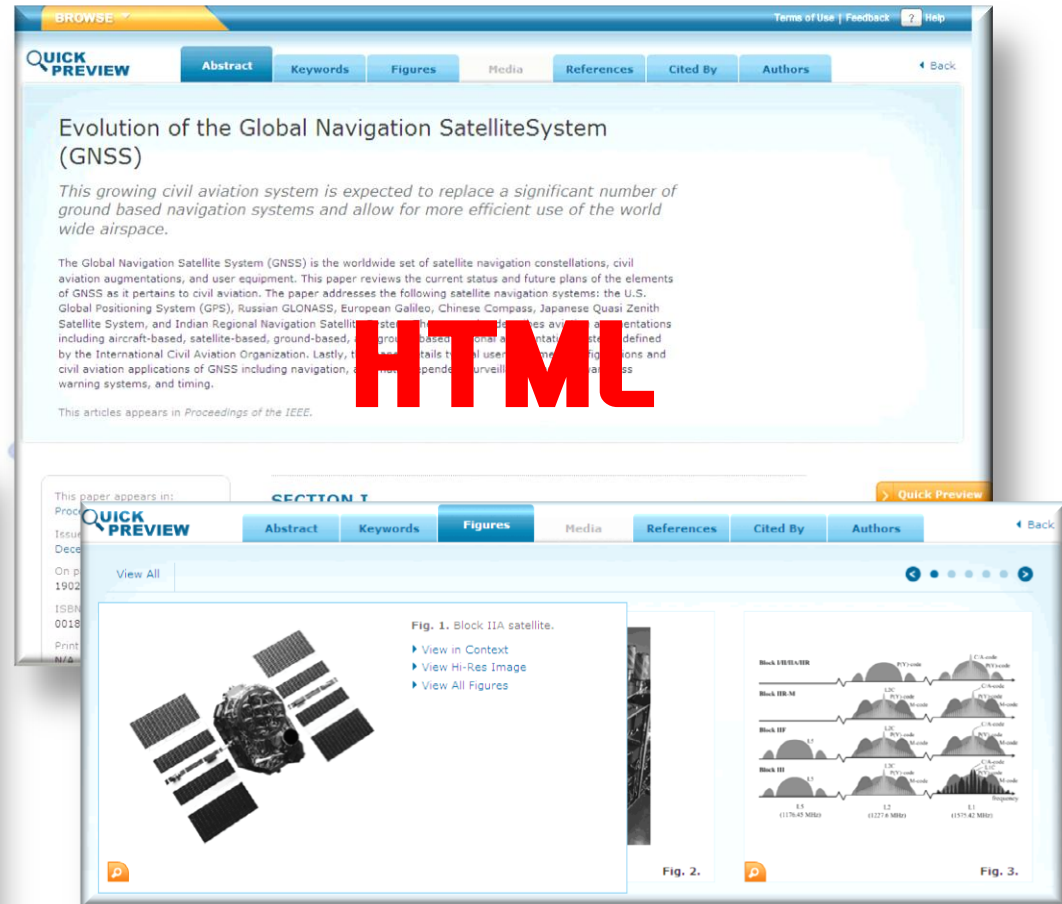
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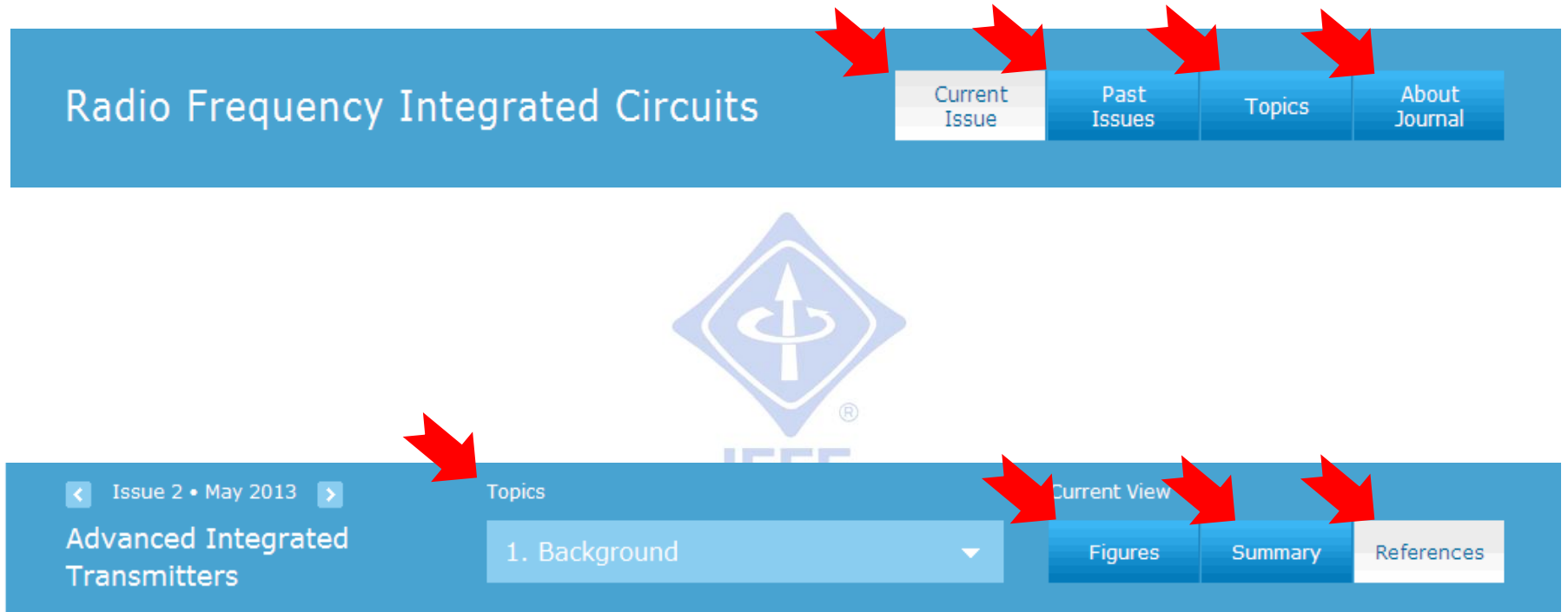
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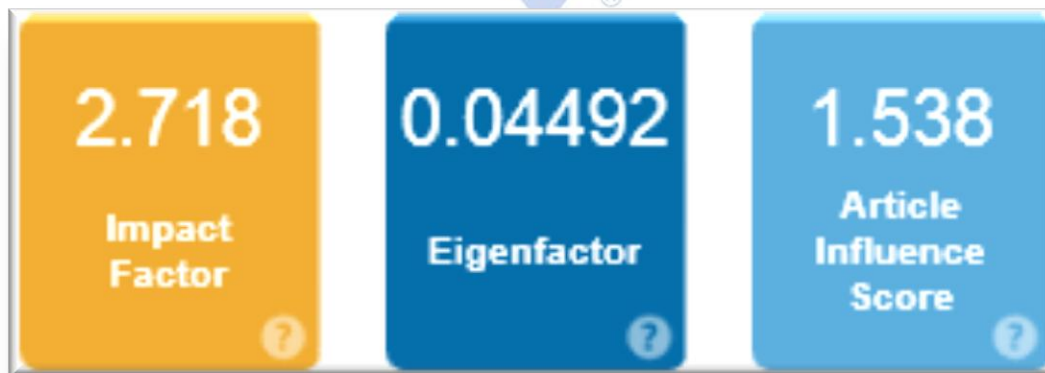
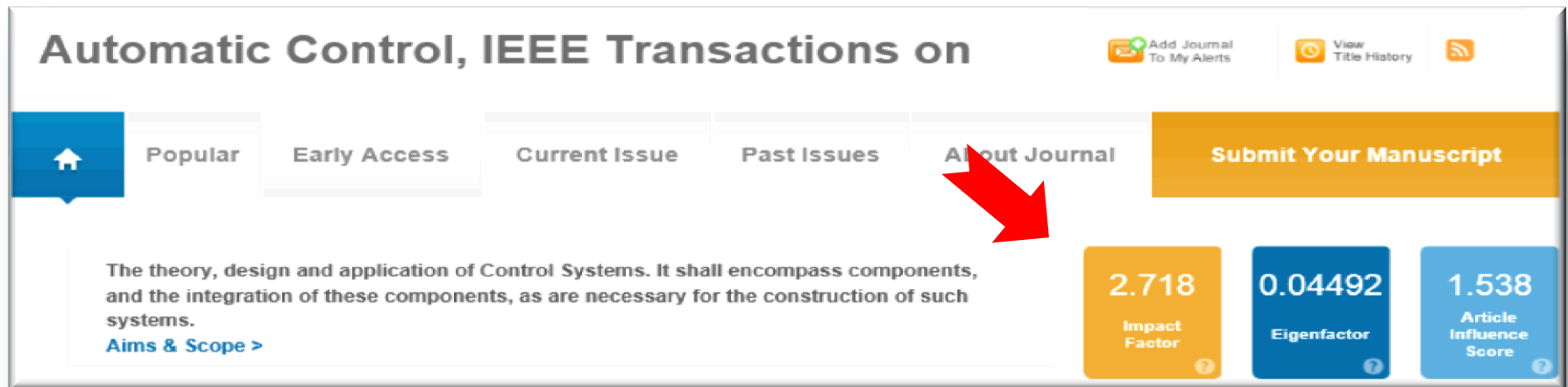
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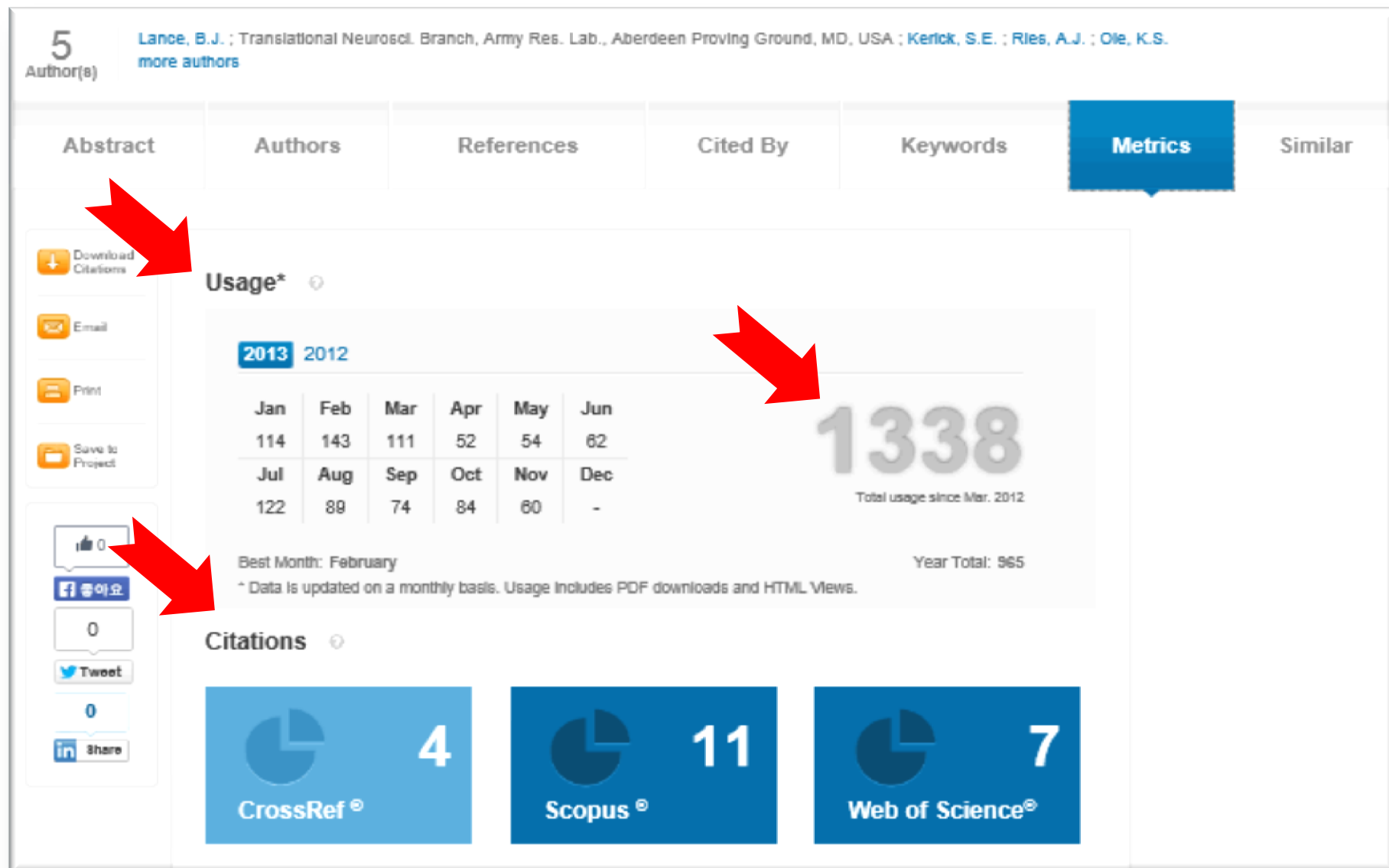
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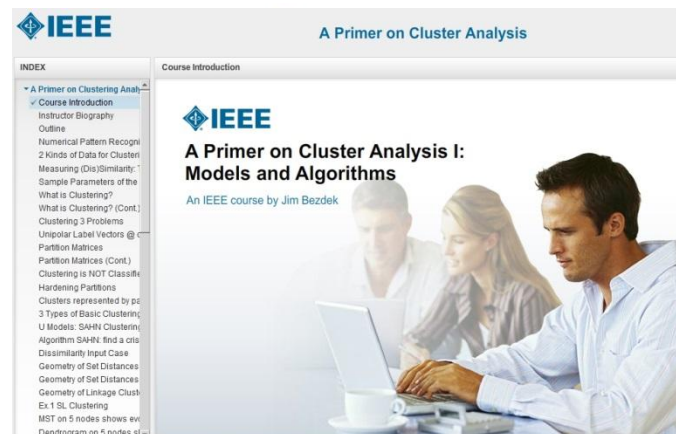
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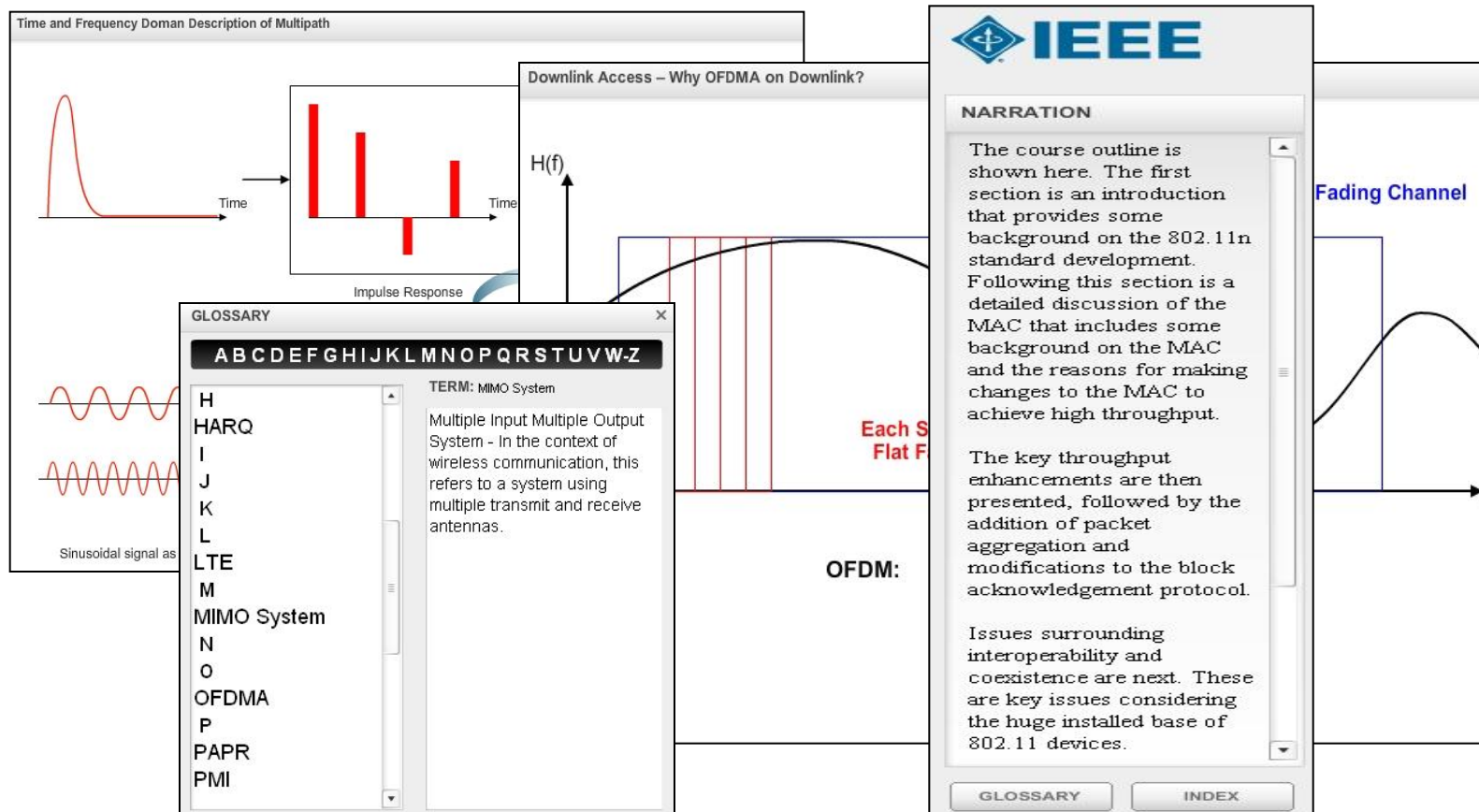
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The left screenshot displays the IEEE eLearning Library interface for the course "Fundamentals of LTE Air Interface Standards and Technologies". The sidebar index lists various topics, including "Fundamentals of LTE Air Interface Standards and Technologies", "GPP: Requirements on LTE Key Advanced Technologies", "LTE Frame Structure", "TDD: Uplink-Downlink Configuration", "LTE Downlink Transmission", "Downlink Access - Why OFDM?", "Downlink Physical Channels", "HARQ", "PMCH - MBSFN Transmission", and "PMCH - MBSFN Transmission". The main content area shows the course title and a video player with a progress bar at 0:06/0:15.

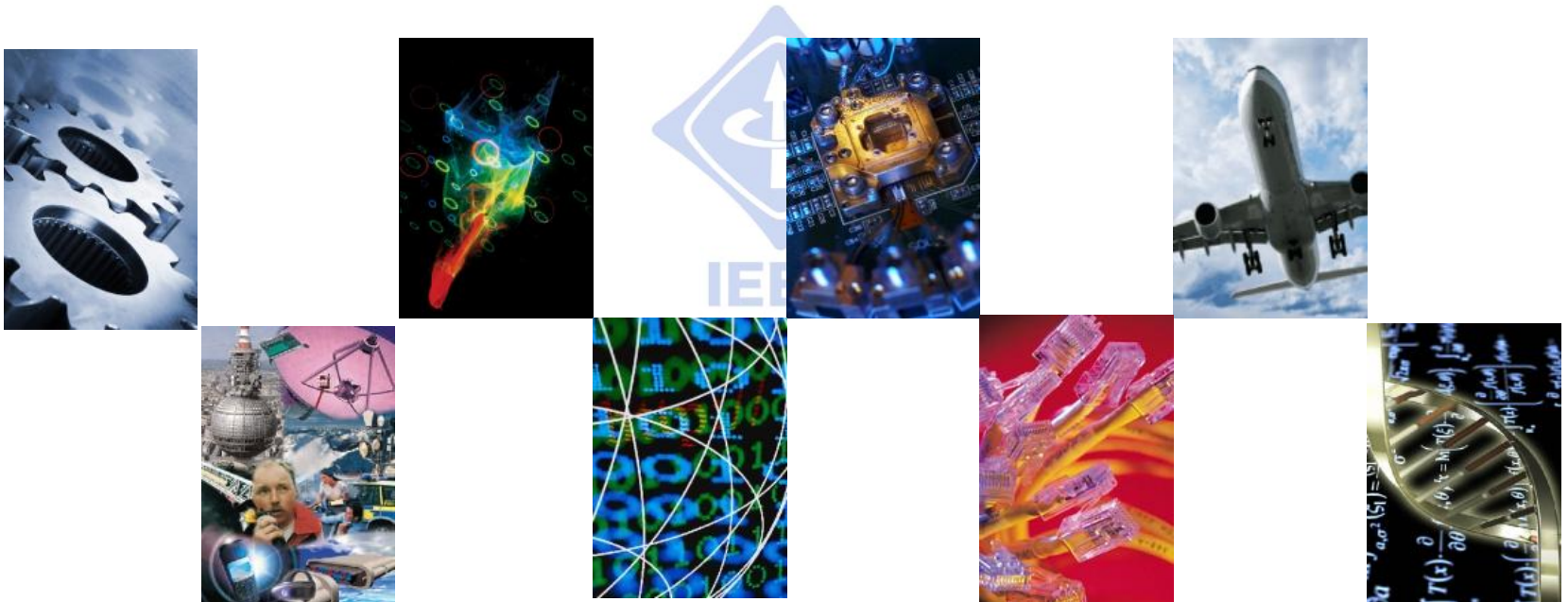
The right screenshot shows a video player displaying a diagram of Inter-symbol Interference (ISI). The diagram illustrates a two-ray equal gain profile with a transmitter and receiver. It shows the direct path and indirect path signals, along with the received signal waveform. The diagram includes the following text:

- Transmitter
- Indirect Path
- Direct Path
- Receiver
- Received Power
- Two-ray Equal Gain Profile
- Received Signal
- τ/T small \rightarrow negligible ISI
- τ/T large \rightarrow severe ISI

② 오디오, 애니메이션, 그래픽, 수치 및 용어사전을 통한 학습 효과 최대화



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The screenshot shows the IEEE eLearning Library tutorial page for 'IEEE 802.11n MAC Layer'. The page includes a 'Find a Tutorial' search bar, a 'Topic outline' section, and a 'Click to play' button. The tutorial details include the author (Stacey, Robert), publication date (Feb-2009), and a description of the tutorial content. A red circular arrow highlights the transition from the search results to the tutorial page.



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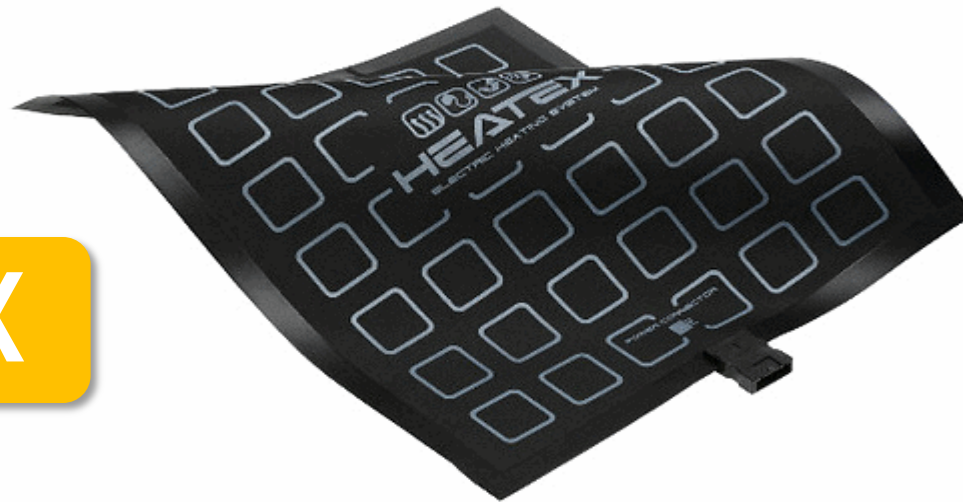


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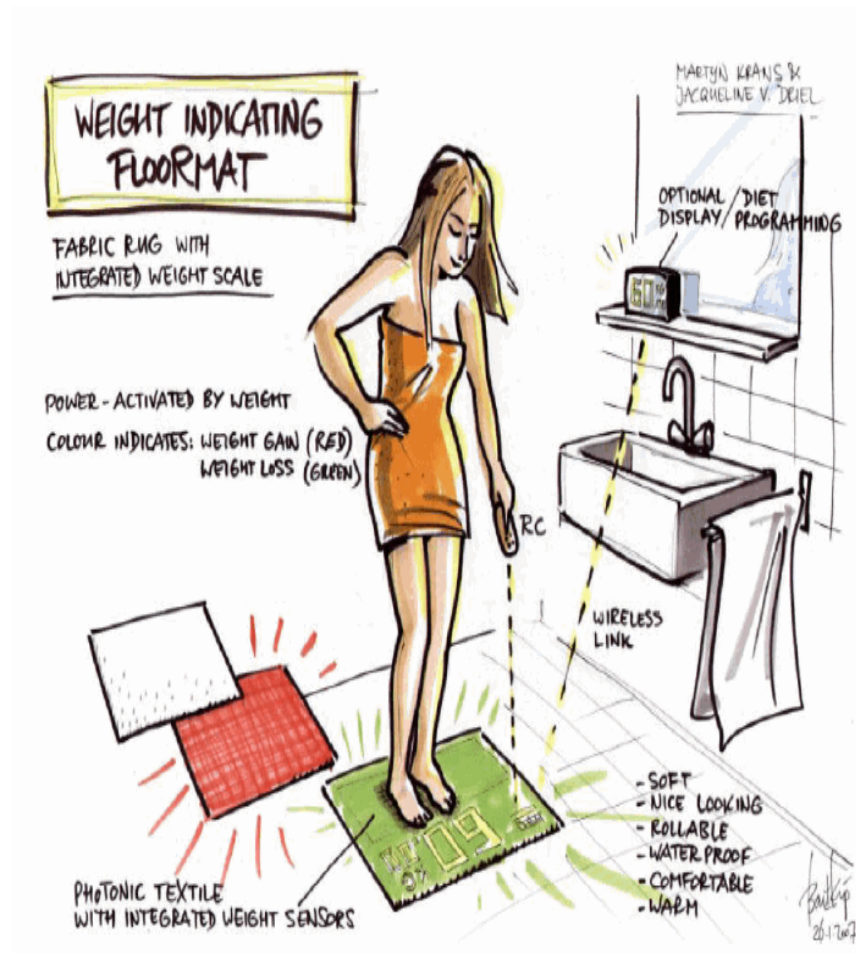
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Wearable Sensors/Systems and Their Impact on Biomedical Engineering

An Overview from the Guest Editor



PAOLO BONATO

Recent advances in miniature devices, as well as mobile and ubiquitous computing, have fostered a dramatic growth of interest for wearable technology. Wearable sensors and systems have evolved to the point that they can be considered ready for clinical application. This is due not only to the tremendous increase in research efforts devoted to this area in the past few years but also to the large number of companies that have recently started investing aggressively in the development of wearable products for clinical applications. Stable trends showing a growth in the use of this technology suggest that soon wearable systems will be part of routine clinical evaluations.

The interest for wearable systems originates from the need for monitoring patients over extensive periods of time. This case arises when physicians want to monitor individuals whose chronic condition includes risk of sudden acute events or individuals for whom interventions need to be assessed in the home and outdoor environment. If observations over one or two days are satisfactory, ambulatory systems can be utilized to gather physiological data. An obvious example is the use of ambulatory systems for ECG monitoring, which has been part of the routine evaluation of cardiovascular patients for almost three decades. However, ambulatory systems are not suitable when monitoring has to be accomplished over periods of several weeks or months, as is desirable in a number of clinical applications.

Wearable systems are totally noninvasive devices that allow physicians to overcome the limitations of ambulatory technology and provide a response to the need for monitoring individuals over weeks or even months. They typically rely on wireless, miniature sensors enclosed in patches or bandages, or in items that can be worn, such as a ring or a shirt. They take advantage of hand-held units to temporarily store physiological data and then periodically upload that data to a database server via a wireless LAN or a cradle that allow Internet connection. The data sets recorded using these systems are then processed to detect events predictive of possible worsening of the patient's clinical situation or they are explored to assess the impact of clinical interventions.

All these aspects of wearable technology are covered by this special issue, which is introduced by four commentaries of physicians who share with the readership their vision on future clinical applications of wearable technology, thus pointing

out its tremendous potential. Phil Winkley, M.D., professor of medicine at The Ohio State University Division of Cardiology, shares with us his vision on potential applications of wearable devices in cardiovascular research and clinical practice. Walker Proffers, M.D., Ph.D., chairman of the Department of Physical Medicine and Rehabilitation at Harvard Medical School, provides us with a clinician's viewpoint of the dramatic improvements in patient management that wearable devices could foster. David G. Standant, M.D., Ph.D., associate professor of neurology, Harvard Medical School and associate neurologist at Massachusetts General Hospital, points out in his commentary the clinical relevance and potential outcomes of monitoring motor fluctuations in patients with Parkinson's disease. Finally, Joel Stein, M.D., director of the stroke program and chief medical officer at Spaulding Rehabilitation Hospital, highlights the need for monitoring poststroke hemiplegic patients in the home and outdoor environment in order to assess the impact of clinical interventions and plan more effective rehabilitation strategies.

The first five articles of this special issue are focused on the development of sensors and systems. In the first article, Asada et al. describe the evolution of the ring sensor over the past eight years. This is likely the most renowned project in the area of wearable devices. The result of several years of work is a pulse oximetry sensor that allows one to continuously monitor heart rate and oxygen saturation in a totally unobtrusive way. The device is shaped like a ring and thus it can be worn for long periods of time without any discomfort to the subject. The ring sensor is equipped with a low-power transmitter that accomplishes bidirectional communication with a base station, thus allowing one to reconfigure the sensor when necessary and to upload data at any point in time. In a nutshell, this is a "jewel" in the wearable technology arena.

The second article, by Park and Jayaraman, demonstrates the great impact on the clinical potential of wearable systems of the Georgia Tech Wearable Motherboard, the result of a revolutionary idea that allowed Dr. Jayaraman's team to develop a garment (i.e., a shirt) that actually functions as a wearable health monitoring system. This concept has been developed into a product that is now commercially available and allows one to record heart rate, body temperature, motion, position, barrier penetrations, and the like in a totally nonobtrusive manner. Park and Jayaraman point out a

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Wearable Sensors/Systems
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Guest Editor

Smart Fabrics and Interactive Textile



Smart Fabrics and Interactive Textile: State of the Art and Future Challenge

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Smart Fabrics and Interactive Textile: State of the Art and Future Challenges

An IEEE course by Rita Paradiso

30 March 2009

Smart Fabrics and Interactive Textile: State of the Art and Future Challenges

Rita Paradiso

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Course Note



Wearable Sensors/Systems and Their Impact on Biomedical Engineering

An Overview from the Guest Editor

Guest Editorial

New Generation of Smart Wearable Health Systems and Applications

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Shirley Copley¹, Yueshan Wu², King-Tong Lau¹, Gordon G. Wallace², Dermot Diamond²

¹Adaptive Sensors Group, Adaptive Information Cluster, Dublin City University, Dublin 9, Ireland

²AIRC Centre of Excellence for Electronic Materials, Intelligent Polymer Research Institute, University of Wollongong, Northfields Avenue, Wollongong, NSW 2522, Australia

Fabric-based fluid handling platform with integrated analytical capability

Introduction

Wearable textiles to perform on-body bio-chemical analysis are a novel concept in the field of wearable technologies. This work is part of the Textiles, an EU funded project aiming to develop textile-based sensors for monitoring biological fluids (http://www.textiles-eu.net). A fabric-based fluid handling system has been developed which has processing advantages including (1) potential for encapsulation of analytical functions like sample application, reagent addition, initiation of reaction manifold, separation of sample components, variety of detection module and addition of substrate; (2) low power requirement for the transport of fluid; (3) compact structure, easy to fabricate.

Methods

A fabric fluidic channel is made from a micrometric wicking fabric (polyamide hexamyl) in combination with a superabsorbent (SAP) micro-membrane (Microchisel[®]) placed at the end of the channel (Fig. 1(a)). The SAP provides a passive pumping mechanism to control the flow of fluid through the channel and store waste products. To control the delivery of the sample to the channel a lateral flow valve using a polyimide actuator has been implemented (Fig. 1(b)). The platform is configured to incorporate (1) a wicking channel, (2) lateral flow valve for the addition of sample, reagent and substrate, (3) detection unit to an external pump. Conventional flow liquid analysis may be performed using this configuration when sample is introduced to the carrier channel via the actuator valve. Mixing occurs along the channel before reaching a detection zone where a detection unit can be used to generate the analytical signal. The system is moved to the subsequent material which can be replaced with a fresh unit when exhausted. Fluid flow sensors can be prepared by direct immobilization of sensing materials, e.g. pH indicator dye, onto the channel. Separation of mixture may also be performed with channels of specific properties (porosity).



Figure 1 (a) Fabric fluidic channel for sample collection, delivery and analysis (b) Polyimide (PI) lateral flow valve

Results and discussion

The separation of methyl blue and methyl orange was performed on the fabric platform. For example, at pH 5, methyl orange was eluted before methyl blue while at the pH of 9, the reverse was observed. This concept can be applied to many applications where the relative rate of migration of sample components is affected by interaction with the channel surface and the carrier. Sensing capabilities have been demonstrated by immobilizing pH sensitive dye onto the fabric fluidic channel. By using optical detection techniques, the pH of the sample can be estimated.

Conclusion

A fabric-based fluidic device incorporating a novel lateral valve has been successfully constructed. It has the ability to transport a sample fluid through the channel; a material library for sensing. This novel approach integrates liquid management, liquid distribution, waste storage, liquid flow control and analytical functions (separation, chemical/biochemical analysis) into one package. Applications may include environmental analysis, personal health monitoring, drug delivery, diagnostic diagnostics etc.

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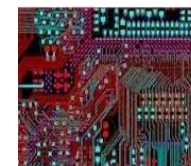
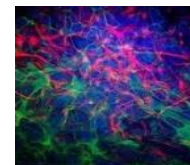


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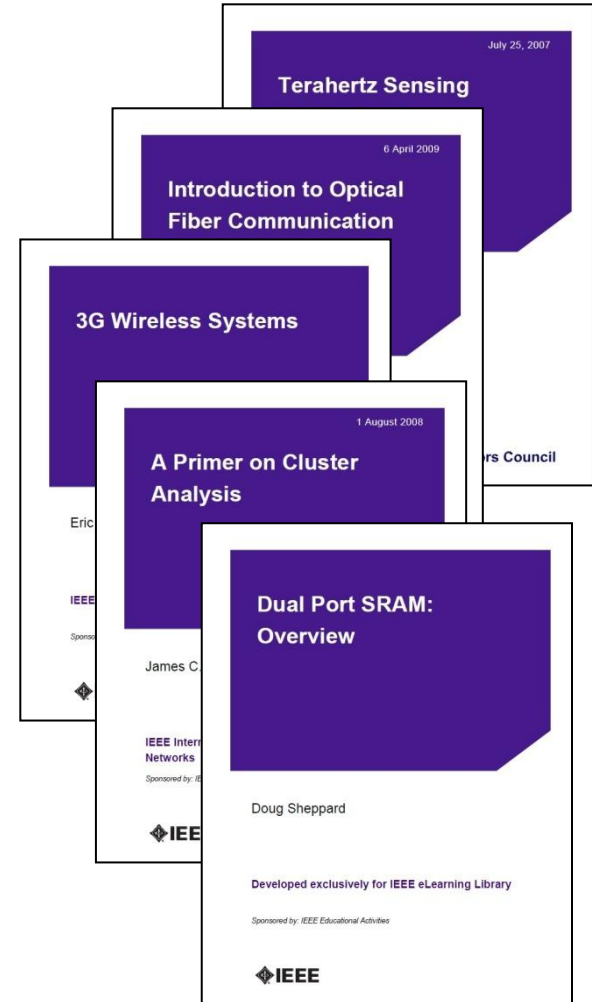
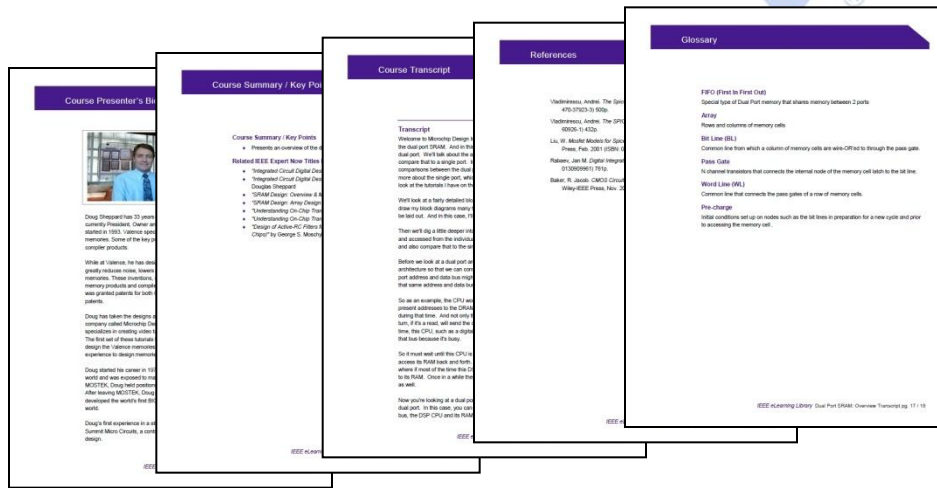
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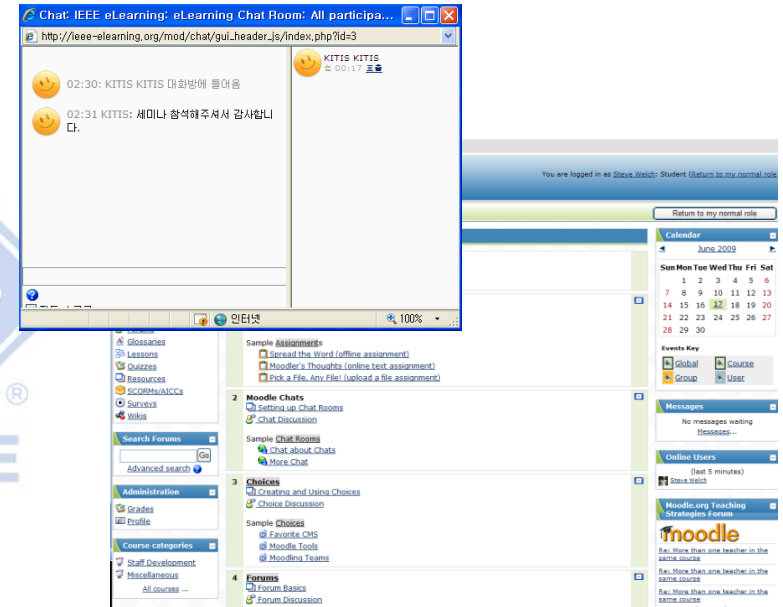
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